

Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims

1. (currently amended) A disk array control apparatus comprising:

a control element constructed and arranged so that the control element generates a multitask for processing a single I/O request, the multitask including first tasks with a first priority and second tasks with a second priority that is lower than the first priority, wherein an upper limit of a number of the first tasks is a first number;

a first element constructed and arranged so that the first element calculates a cache hit ratio at a disk cache memory; and

a second element constructed and arranged so that when the single I/O request is ~~new tasks are~~ input to the disk array control apparatus the second element executes the [[new]] first tasks as a first priority unless a until the number of the [[new]] first tasks and tasks in execution as the first priority exceeds a reaches the first number, and executes the [[new]] second tasks and the first tasks as a second priority when the number of the [[new]] first tasks and tasks in execution as the first priority exceeds reaches the first number, except that the second element executes only the first tasks when the calculated

cache hit ratio is above a prescribed value even if the number of first tasks reaches the first number

~~wherein the first priority is higher than the second priority, and~~

~~wherein said second element adjusts a number of activated ones of the tasks according to the calculated cache hit ratio.~~

2. (currently amended) The disk array control apparatus as claimed in claim 1, wherein ~~[[the]]~~ a number of ~~activated ones of the tasks in the multitask~~ decreases when the calculated cache hit ratio is above ~~[[a]]~~ the prescribed value and increases when the calculated cache hit ratio is below the prescribed value.

3. (currently amended) A disk array control apparatus comprising:

a control element constructed and arranged so that the control element generates a multitask for processing a single I/O request, the multitask including first tasks with a first priority and second tasks with a second priority that is lower than the first priority, wherein an upper limit of a number of the first tasks is a first number;

a first element constructed and arranged so that the first element calculates a cache hit ratio at a disk cache memory; and

a second element which executes ~~[[new]]~~ the first tasks ~~input to the disk array control apparatus as a first priority unless a number of the new tasks and tasks in execution as the first priority exceeds a~~ until a number of the first tasks

reaches the first number, and executes the [[new]] first and second tasks when the number of the first tasks reaches as a second priority when the number of the new tasks and tasks in execution as the first priority exceeds the first number,

wherein the first priority is higher than the second priority, and

wherein said second element executes only the first priority tasks when the cache hit ratio is above a prescribed value and executes both the first priority tasks and the second priority tasks when the cache hit ratio is below the prescribed value.

4. (currently amended) [[A]] The disk array control apparatus according to claim 1, further comprising:

a host I/O reception unit arranged so that the host I/O reception unit receives as an input [[an]] the single I/O process request from a host computer, the I/O reception unit generating as an output the single I/O process request[[;]], and

wherein the first element includes

an I/O process execution unit that executes new tasks input to the disk array control apparatus as a first priority unless a number of the new tasks and tasks in execution as the first priority exceeds a first number and executes the new tasks as a second priority when the number of the new tasks and tasks in execution as the first priority exceeds the first number, wherein the first priority is higher than the second priority,

a cache hit determination unit constructed and arranged to determine whether or not the single I/O ~~process~~ request is causing a cache hit at ~~[[a]]~~ the disk cache memory~~[[;]]~~, and

a cache hit ratio monitor unit constructed and arranged to calculate and output ~~[[a]]~~ the cache hit ratio within some period of time by using a determination result of the cache hit determination unit, ~~and~~

~~an execution task selection unit constructed and arranged to assign each said I/O process request to either the first or second priority tasks, the execution task selection unit assigning said I/O process request to the first priority tasks when the cache hit ratio is not less than some prescribed value and assigning said I/O process request to the second priority tasks when the cache hit ratio is less than the prescribed value.~~

5. (currently amended) The disk array control apparatus as claimed in claim 4, further comprising:

a task priority change unit constructed and arranged to dynamically change one of the second tasks ~~priority task~~ to one of the first ~~priority~~ tasks after starting execution of the one second ~~priority~~ task, the task priority change unit changing the changed task ~~one of the first priority tasks~~ back to one of the second tasks ~~priority task~~ at execution termination time.

6. (currently amended) A disk array control method comprising the steps of:

generating a multitask for processing a single I/O request,
the multitask including first tasks with a first priority and
second tasks with a second priority that is lower than the first
priority, wherein an upper limit of a number of the first tasks
is a first number;

calculating a cache hit ratio at a disk cache memory;

~~inputting new tasks;~~

executing the [[new]] first tasks ~~as a first priority unless~~
~~a number of the new tasks and tasks in execution at the first~~
~~priority exceeds a~~ until a number of the first tasks reaches the
first number; and

executing the [[new]] first and second tasks ~~as a second~~
~~priority when the number of the new tasks and tasks in execution~~
~~at the first priority exceeds~~ when the number of the first tasks
reaches the first number, wherein the first priority is higher
than the second priority; and except that only the first tasks
are executed when the calculated cache hit ratio is above a
prescribed value even if the number of first tasks reaches the
first number

~~adjusting a number of activated ones of the tasks according~~
~~to the calculated cache hit ratio.~~

7. (currently amended) The disk array control method as
claimed in claim 6, wherein the adjusting step comprises the
steps of:

decreasing the number of ~~activated ones of the tasks~~ in the multitask when the cache hit ratio is above ~~[[a]]~~ the prescribed value; and

increasing the number of ~~activated ones of the tasks~~ in the multitask when the cache hit ratio is not above the prescribed value.

8. (canceled)

9. (currently amended) ~~[[A]]~~ The disk array control method according to claim 6, further comprising the steps of:

inputting ~~[[an]]~~ the single I/O ~~process~~ request from a host computer;

determining whether the single I/O ~~process~~ request is causing a cache hit at a disk cache memory; and

calculating ~~[[a]]~~ the cache hit ratio within some period of time based on results of the determining step~~[[;]]~~

~~inputting new tasks;~~

~~executing the new tasks as a first priority unless a number of the new tasks and tasks in execution at the first priority exceeds a first number;~~

~~executing the new tasks as a second priority when the number of the new tasks and tasks in execution at the first priority exceeds the first number, wherein the first priority is higher than the second priority;~~

~~assigning the I/O process request to the first priority tasks when the cache hit ratio is not less than some prescribed value; and~~

~~assigning the I/O process request to the second priority tasks when the cache hit ratio is less than the prescribed value.~~

10. (currently amended) The disk array control method as claimed in claim 9, further comprising the step of:

changing one of the second tasks ~~the second priority task~~ to one of the first priority tasks after starting execution of the one of the second tasks ~~second priority task~~, and changing the changed task ~~one of the first priority tasks~~ back to one of the second tasks ~~the second priority task~~ at execution termination time.

11-16. (canceled)